REMARKS

This Amendment is in response to the Office Action mailed July 30, 2002. In the Office Action, the Examiner rejected claims 21-24 under 35 U.S.C. § 102 and rejected claims 1-20 under 35 U.S.C. § 103. Applicants have amended claims 1, 10, 16, 19, and 21. No new claims have been added. Claims 1-24 remain pending in the application. Reconsideration in light of the amendments and remarks made herein is respectfully requested.

Drawings

The Draftperson indicated that the drawings were objected to because the lines, numbers, and letters did not conform to 37 CFR 1.84(l).

Since the drawings are acceptable for examination purposes, Applicants will postpone submission of formal drawings until the application is allowed.

Nonstatutory Double Patenting Rejection

2-3. The pending claims 1-20 have been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of copending Application No. 09/271,008 and also over claims 1-22 of copending application No. 09/131,141.

Applicants submit that Application No. 09/271,008, referenced above, is the present application and thus cannot serve as a conflicting application.

It is stated in the Office Action that a timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. Applicants respectfully acknowledge this provisional obviousness-type double patenting rejection of the pending claims. However,

Applicants respectfully decline to file a terminal disclaimer at this point in time because the present application and copending Application No. 09/131,141 have not been allowed. Applicants would like to withhold the filing of any such terminal disclaimer until either the present application or the copending application is allowed.

Rejections Under 35 U.S.C. §102

4. Claims 21-24 have been rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,192,028 to Simmons et al. (hereinafter referred to as Simmons).

The Examiner asserts that Simmons teaches every limitation claimed in independent claim 21.

Applicants respectfully submit that Simmons does not teach, disclose, or suggest the limitation of:

> "a receiver buffer to *promote the packets of data in an assigned order based on pointer values* with *priority given to* pointer values in the *first pointer value buffer*." [emphasis added]

Simmons discloses a network switch which has a shared memory architecture for storing data frames and a set of programmable thresholds to specify when flow control should be initiated on a selected network port (Simmons, Abstract). Specifically, Simmons states that the network switch includes a queue for storing free frame pointers, each specifying available memory locations in an external memory for storing data frames received from a network station (Simmons, Abstract). Furthermore, Simmons discloses that the network switch takes a frame pointer from a free buffer queue for each received data frame and stores the received data frame in the location in external memory specified by the frame pointer while a decision making engine within the switch determine the appropriate destination ports. (Simmons, Abstract). In particular, Simmons discloses that data packets from a network

station are received by the corresponding MAC port and stored in the corresponding receive FIFO. The received data packets are output from the corresponding receive FIFO to the external memory interface for storage in the external memory (Simmons, Col. 6, lines 5-20). Simmons also states that the header of the received packet is also forwarded to a decision making engine which comprises an internal rules checker and an external rules checker interface to determine which MAC ports will output the data packet (Simmons, Col. 6, lines 21-24). The internal rules checker and external rules checker provide the decision making logic for determining the destination MAC port for a given data packet (Simmons, Col. 6, lines 29-32). Simmons further states that the rules checker, based on information in the header, determines from where the frame packet will be cast, i.e., through which port or ports will the frame packet be transmitted (Col. 7, lines 47-56). A frame pointer is assigned to each data packet as the data packet is removed from the FIFO, the frame pointer identifying the location in external memory where said data packet is stored. (Col. 7, line 57 to Col. 8, line 20) The pointer serves no other purpose than identifying a storage location for the data packet.

However, Simmons does not disclose or suggest the above recited element of claim 21. Specifically, Simmons does not disclose or suggest "a buffer to promote packets of data in an assigned order based on pointer values with priority given to pointer values in the first pointer value buffer." In fact, as described above, Simmons explicitly discloses that the data packets received from a network station are stored in a corresponding receive FIFO (First-In-First-Out) buffer in the order in which each packet/frame is completely received and then output from the corresponding receive FIFO buffer to the external memory interface for storage in the external memory. By definition, the FIFO (First-In-First-Out) buffer dictates the order in which the data packets are output from the FIFO buffer to the external memory interface for storage in the external memory. That is, a data packet that is stored first in the FIFO buffer will be output first to the external memory interface. Simmons does not teach or

suggest that pointer values may be employed in promoting packets in an assigned order nor permits prioritizing some packets as claimed.

By contrast, the claimed invention uses a pointer value to promote packets of data in an assigned order based on pointer values with priority given to pointer values in the first pointer value buffer. Thus, unlike the system in Simmons which orders its' packets according to the order in which packets are completed (FIFO) and with no prioritization, the claimed invention promotes packets based to the pointer value and is able to prioritize packets corresponding to pointers associated with a particular pointer value buffer (e.g., higher priority pointer value buffer). The claimed invention permits using the pointer values to determine the order in which the corresponding packets or frames are promoted, independent of when packet reception is completed (e.g., frames which were transmitted first are promoted before frames which, even if completed first, arrived later). (Application, page 16, line 15 to page 17, line 9; page 19, line 5 to page 21, line 18)

Thus, it is clear that Simmons does not disclose or suggest any mechanism or method in which a pointer value associated with a frame or data packet stored in a receive buffer is used to determine an order in which the respective frame or data packet is sent from the buffer to another device (e.g., output from the buffer to the external memory interface) nor a way to prioritize a frame or data packet based on the type of associated pointer value buffer. In fact, because of the nature of the receive FIFO buffer described in Simmons, the data packets as described in Simmons have to be read out of the receive FIFO buffer in the first-in-first-out manner. This is clearly different and distinguishable from what is claimed in the above-recited element of claim 21 where data packets a read out according to their relative order of transmission.

Because Simmons does not teach or suggest the above-recited element of independent claim 21, Applicants respectfully submit that claim 21 is not anticipated or rendered obvious by Simmons. Accordingly, Applicants respectfully request that the rejection of claim 21 be withdrawn.

A minor amendment has been made to claim 21 to more clarify the claim language. This is not a substantive change nor is it made for purposes of patentability or to overcome prior art.

Since claims 22-24 depend from the independent claim 21 and include additional limitations, Applicants respectfully submit that claims 22-24 are also not anticipated or rendered obvious by Simmons. Withdrawal of the rejections of these claims is therefore respectfully requested.

Rejections Under 35 U.S.C. §103

5. Claims 1-20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Simmons in view of Frazier et al. (U.S. Patent No. 5, 784, 559), hereinafter referred to as Frazier.

To establish a prima facie case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination must be found in the prior art, not in applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Applicants respectfully submit that claims 1-20, as amended, are not obvious over Simmons in view of Frazier for the reasons and explanations set out below.

As to the amended independent claim 1, Applicants respectfully submit that Simmons and Frazier do not teach, disclose, or suggest the following limitation, for the reasons and explanations provided above with respect to the amended claim 1:

> "assigning a plurality of pointer values to a corresponding plurality of records in appropriate buffers, from among a plurality of pointer value buffers associated with the corresponding plurality of virtual links, *based at least in part on the relative order in which data packets are transmitted* on each of the links, *the corresponding pointer value associated with each respective data packet*

being used to determine an order in which the respective data packet is promoted." [emphasis added]

As discussed above, Simmons fails to disclose or suggest any mechanism or method in which a pointer value associated with a data frame is used to determine an order in which the respective frame is read out of a receive buffer. Again, Simmons explicitly states that the data packets received from a network station are stored in a receive First-In-First-Out (FIFO) buffer and output from the receive FIFO buffer to the external memory interface for storage in the external memory. Thus, the data packets stored in the receive FIFO buffer can only read out of the receive FIFO in one manner, i.e., first-in-first-out. This does not give any weight or consideration to pointer values in promoting packets nor permits prioritizing some packets as claimed. Again, as explained above, the frame pointer as described in Simmons is not used to determine the order in which the data packets are read out of the receive FIFO buffer.

By contrast, the claimed invention uses a pointer value to denote the relative order in which the beginning of a packet/frame is received (Application, page 16, lines 12-15), not merely when the packet is completed as in Simmons. Unlike the system in Simmons which orders its packets according to the order in which packets are completed, the claimed invention orders packets according to the "relative order in which data packets are transmitted." This permits using the pointer values to determine the order in which the corresponding frames are promoted, independent of when packet reception is completed (e.g., frames which arrive first are promoted before frames which, even if completed first, arrived later). (Application, page 16, line 15 to page 17, line 9; page 19, line 5 to page 21, line 18)

Frazier discloses a flow control method in a full-duplex Ethernet network in a lossless fashion using CSMA/CD. According to Frazier, uniquely identifiable flow control transmit on/off messages are transmitted by a receiving station about to be congested to the transmitting station whose data output is to be controlled (Frazier, Abstract). The

transmitting station physical layer receives and decodes these messages. If XOFF is recognized, the transmitting station continuously asserts CRS to its MAC layer at the MII, regardless of the prior CRS current state CRS is continuously asserted until the receiving station transmits an XON flow control signal to indicate its ability to accept further data (Frazier, Abstract, Col. 5, line 43 – Col. 6, line 33).

However, Applicants are unable to find any disclosure or suggestion by Frazier that is directed to the above-recited element of the amended claim 1. Specifically, there is no disclosure by Frazier which teaches or suggests using a pointer value associated with a frame to determine an order in which the respective frame is read out of the receive buffer.

Because Simmons and Frazier do not teach or suggest the above-recited limitation of the amended claim 1, Applicants respectfully submit that the amended claim 1 is not obvious over Simmons in view of Frazier. Independent claims 10, 16, and 19 each include a limitation similar to that distinguished in claim 1. Accordingly, Applicants respectfully request that the rejection of independent claims 1, 10, 16, and 19 be withdrawn. Since claims 2-9, 11-15, 17-18, and 20 depend from one of the amended claims 1, 10, 16, or 19, and include additional limitations, Applicants respectfully submit that claims 2-9, 11-15, 17-18, and 20 are also not obvious over Simmons in view of Frazier. Withdrawal of the rejections of claims 1-20 is therefore respectfully requested.

VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (Amended) A method for preserving frame order across an aggregated link comprising:

receiving up to a plurality of indications denoting commencement of data packet transmission over the aggregated link having a plurality of virtual links each associated with a particular quality of service level; and

assigning a plurality of pointer values to a corresponding plurality of records in appropriate buffers ~~of~~, from among a plurality of pointer value buffers associated with the corresponding plurality of virtual links, based, at least in part, on the relative order in which data packets are transmitted on each of the links, the corresponding pointer value associated with each respective data packet being used to determine an order in which the respective data packet is promoted.

10. (Amended) An apparatus comprising:

a receive buffer having a plurality of records in which to store frames of data received from a plurality of virtual links, each virtual link associated with a particular quality of service level;

a plurality of pointer value buffers each associated with at least one of the plurality of virtual links; and

a network interface, coupled to the receive buffer and the pointer value buffers, to assign a plurality of pointer values to an appropriate buffer ~~of~~, from among the plurality of pointer value buffers, in response to the commencement of transmission of data packets ~~of data~~ on the associated virtual link, the assignment of pointer values based, at least in part, on the relative order in which the frames are transmitted on each of the virtual links, the corresponding pointer value associated with each respective frame being used to determine an order in which the respective frame is promoted from the receive buffer.

16. (Amended) In a data network, a method for preserving frame order of a plurality of frames transmitted across a plurality of virtual links of a multi-link trunk, each of the virtual links is associated with a discrete quality of service, the method comprising:

~~(a)~~ receiving up to a plurality of indications denoting commencement of frame transmission on each of the virtual links of the multi-link trunk; and

~~(b)~~ assigning a plurality of pointer values to a plurality of records in appropriate buffers, the plurality of records corresponding to a number of indications received from each of the virtual links ~~in appropriate ones~~, the appropriate buffers chosen from among ~~of~~ a plurality of pointer value buffers associated with the plurality of virtual links, the assignment of the plurality of pointer values based~~,~~ at least in part~~,~~ on a relative order in which the indications are received, the corresponding pointer value associated with each respective indication being used to determine an order in which each corresponding frame is promoted.

19. (Amended) A storage medium comprising a plurality of executable instructions which, when executed by a processor, cause the processor to implement a plurality of functions including a function to preserve frame order of frames transmitted over a plurality of virtual links each associated with a discrete quality of service, the function implementing pointer value ~~buggers~~ buffers associated with each of the virtual links and, upon receiving an indication of frame transmission from the virtual link, stores pointer values in appropriate ~~ones~~ buffers ~~of~~ from among the pointer value buffers, the pointer values denoting the relative order of commencement of frame transmission on the virtual link, the pointer value associated with each respective indication of frame transmission being used to determine an order in which each corresponding frame is promoted.

21. (Amended) An apparatus comprising:

a multi-link trunk including a high-speed link an a low-speed link;

a network interface including

a first pointer value buffer associated with the high-speed link,

a second pointer value buffer associated with the low-speed link,

a receive buffer to promote packets of data in an assigned order ~~of~~ based on pointer values with priority given to pointer values in the first pointer value buffer.

Conclusion

In view of the amendments and remarks made above, it is respectfully submitted that the pending claims are in condition for allowance, and such action is respectfully solicited. Authorization is hereby given to charge our Deposit Account No. 02-2666 for any charges that may be due. Furthermore, if an extension is required, then Applicants hereby request such an extension.

Respectfully submitted,

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